

IMPLEMENTATION OF ELECTRONIC MUSCLES IN A PORTABLE COMPUTER  
AS USER INPUT/OUTPUT DEVICES

ABSTRACT OF THE INVENTION

5           A portable computer system contained within a housing that comprises  
an electronic muscle material for performing a plurality of functions. The  
electronic muscle can be used to replace buttons or keys used in many PDAs.  
The movement of the electronic muscle material can charge the battery. When  
10           handled, the electronic muscle material can further detect the left- or right-  
handedness of the user and, based on the handedness, can generate function  
buttons or other alterations to accommodate the user's hand preference and  
finger placement. The electronic muscle can change shape to accommodate  
the user's hand for comfort and, further, as a security function to identify and  
15           authorize the user. Additionally, the electronic muscle material in the housing  
can be caused to vibrate at given frequencies so that it can generate an alarm  
and can function as a speaker or a dynamically directional microphone.